



TECHNOLOGY OF HARDENING AND GEOMETRY IMPROVEMENT OF LARGE DIAMETER ELECTRIC-WELDED PIPES

DESIGNATION

This technology is intended for thermo-treatment of welded joints of large diameter pipes with the increase of their durability and assurance of capability of double electric-welded pipes produced by the Pipe Plant for oil and gas pipelines.

APPLICATION DOMAINS

As a result of thermo-mechanical treatment, based on the use of hot rolling process, electric-welded pipes of large diameter with reinforcement of weld seams can be obtained, which are equivalent on perimeter architectures, hardness and mechanical characteristics indexes.

CONSUMERS

Khartsyzsk Pipe Plant and other pipe-producing enterprises.

DESCRIPTION

The process of thermo-mechanical treatment of electric-welded pipes of large diameter is the following technological consequence of separate operations: 1) local induction heating or heating of areas of the weld joints of the processed pipe to the hot rolling temperatures; 2) hot rolling of the weld joints with absolute reduction, equal to the total height of internal and external reinforcement, that is hot rolling to the finite thickness of the weld joint to match the wall depth on the basic areas of the processed pipe; 3) heat treatment and quality control of the hot-rolled weld joint.

ADVANTAGES

Implementation of the indicated process allows: to pass from cast coarse-grained to deformed fine-grained architecture of weld joint; to improve the levels of mechanical characteristics of the weld joint metal, to maximally approximate them to the analogical coefficients of metal of basic areas, ceteris paribus characteristics of impact elasticity of the weld joint were increased 1.6-2.0 times, that is one of the basic factors of the production of electric-welded pipes in the North execution; to reduce due to the generation of auxiliary tensions and compressive strains the quantity of internal and external flaws of integrity, obtained within the framework of the previous welding process; to fully eliminate the presence of internal and external weld reinforcements, reducing maximally the resistance of the transported substance; to improve the degree of cylindricity of the areas of weld joints due to auxiliary elastic-plastic crimps on the required radius size, which is intrinsic to hot rolling in grooved work rolls.

DEVELOPMENT STAGE

Transition to the above considered technology is possible within the framework of operating plant units by installation of auxiliary systems of local heating, specialized rolling mill and transporting servo-mechanisms. All documentation and calculation methods are available.

IMPLEMENTATION

Development of technology and equipment, providing of technical help at introduction of the process.



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